United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Memorandum

To: Regional Director, Region 2, Albuquerque, New Mexico

Through: Assistant Regional Director, Ecological Services, Region 2, Albuquerque, New Mexico

From: Field Supervisor, Austin Ecological Services Field Office, Austin, Texas

Subject: Biological Opinion for the Davis Ranch Habitat Conservation Plan – Permit TE-204410 (Consultation No. 02ETAU-2019-F-0377)

Enclosed is the biological opinion for the proposed section 10(a)(1)(B) incidental take permit for the Davis McCrary Property Trust's (Applicant) Davis Ranch Habitat Conservation Plan (HCP) to avoid, minimize, and mitigate adverse effects to the endangered golden-cheeked warbler (*Setophaga* [=*Dendroica*] *chrysoparia*).

The biological opinion is based on the Davis Ranch HCP and the accompanying Davis Ranch Environmental Assessment pursuant to the National Environmental Policy Act of 1969, U. S. Fish and Wildlife Service files, discussions with species experts, published and un-published literature available on the species and related impacts, and other sources of information available to the Service. A complete administrative record of this consultation is available at the Austin Ecological Service Field Office.

We appreciate your staff's assistance with this consultation. If you have any questions regarding this biological opinion, please contact Christina Williams at 512-490-0057, extension 235.

Attachment

Biological Opinion

This transmits our biological opinion for the issuance of a U.S. Fish and Wildlife Service (Service) section 10(a)(1)(B) incidental take permit (Permit or ITP) to Davis McCrary Property Trust (Applicant) for the Davis Ranch Habitat Conservation Plan (HCP), which will minimize and mitigate, to the maximum extent practicable, adverse effects from activities affecting the federally endangered golden-cheeked warbler (*Setophaga* [=*Dendroica*] *chrysoparia,* GCWA, Covered Species) pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq., Act). The issuance of a Service Permit to authorize incidental take associated with the HCP is the action for this intra-Service consultation pursuant to section 7 of the Act.

Other species listed as threatened or endangered pursuant to the Act or candidate species that occur in the action area are the endangered: whooping crane (*Grus americana*), *Rhadine exilis* (beetle with no common name), *R. infernalis* (beetle with no common name), Helotes mold beetle (*Batrisodes venyivi*), Government Canyon Bat Cave spider (*Neoleptoneta microps*), Madla cave meshweaver (*Cicurinia madla*), Government Canyon Bat Cave meshweaver (*C. vespera*), Robber Baron Cave meshweaver (*C. baronia*), Cokendolpher cave harvestman (*Texella cokendolpheri*), Braken Bat Cave meshweaver (*C. venii*), Texas wild-rice (*Zizania texana*), Peck's cave amphipod (*Stygobromus pecki*), fountain darter (*Etheostoma fonticola*), Comal Springs dryopid beetle (*Stygoparnus comalensis*), Comal Springs riffle beetle (*Heterelimis comalensis*), and Texas blind salamander (*Eurycea rathbuni*); the threatened San Marcos salamander (*Eurycea nana*); and the candidate bracted twistflower (*Streptanthus bracteatus*), golden orb (*Quadrula aurea*), Texas pimpleback (*Q. petrina*), Texas fatmucket (*Lampsilis bracteata*). However, the proposed action is expected to only affect the GCWA.

I. Consultation History

The Applicant submitted their draft HCP along with their application for an incidental take permit in September 2017. After Service review and comment followed by multiple revisions to the draft HCP, a notice of receipt of the application and availability of the draft HCP and a draft Environmental Assessment (EA) was published in the *Federal Register* on March 18, 2019 (84 FR 9806).

II. Proposed Action

The proposed Federal action associated with the accompanying HCP and permit application is to issue an ITP to the Applicant for otherwise lawful residential and commercial land uses on the Davis Ranch Tract, which is located in northwestern Bexar County, Texas (see Figure 1 of the HCP). The permit term will be 30 years. The Davis Ranch HCP establishes a conservation program that minimizes and mitigates, to the maximum extent practicable, the adverse effects of authorized take of the GCWA.

Section 7(a)(2) of the Act's implementing regulations defines an action area to be all areas affected directly or indirectly by the Federal action and not merely the immediate area affected by the proposed project (50 CFR § 402.02). For the purposes of this biological opinion, the action area is Bexar County, Texas.

The activities covered by the HCP involve the otherwise lawful construction of residential and commercial development with associated infrastructure on the 724-acre Davis Ranch (Permit Area). The Covered Activities include the selective clearing and modification of vegetation; the construction of homes and other buildings, roads, utilities, storm and water quality controls, and related infrastructure; and the ongoing use and maintenance of any infrastructure or other improvements for residential or other purposes (i.e., commercial), including ongoing vegetation maintenance as may be required.

The Applicant's proposed conservation measures include:

1. Avoid clearing during the GCWA's breeding season (March 1 to July 31).
2. While conducting vegetation clearing and/or modification, the Permittee will direct contracted work crews to follow the Texas Forest Service or professional arborist's guidelines for the prevention of the spread of oak wilt.
3. If implemented in its entirety, mitigate through preservation of GCWA habitat a total of 1,176.73 acres.

III. Status of the species – Golden-cheeked Warbler

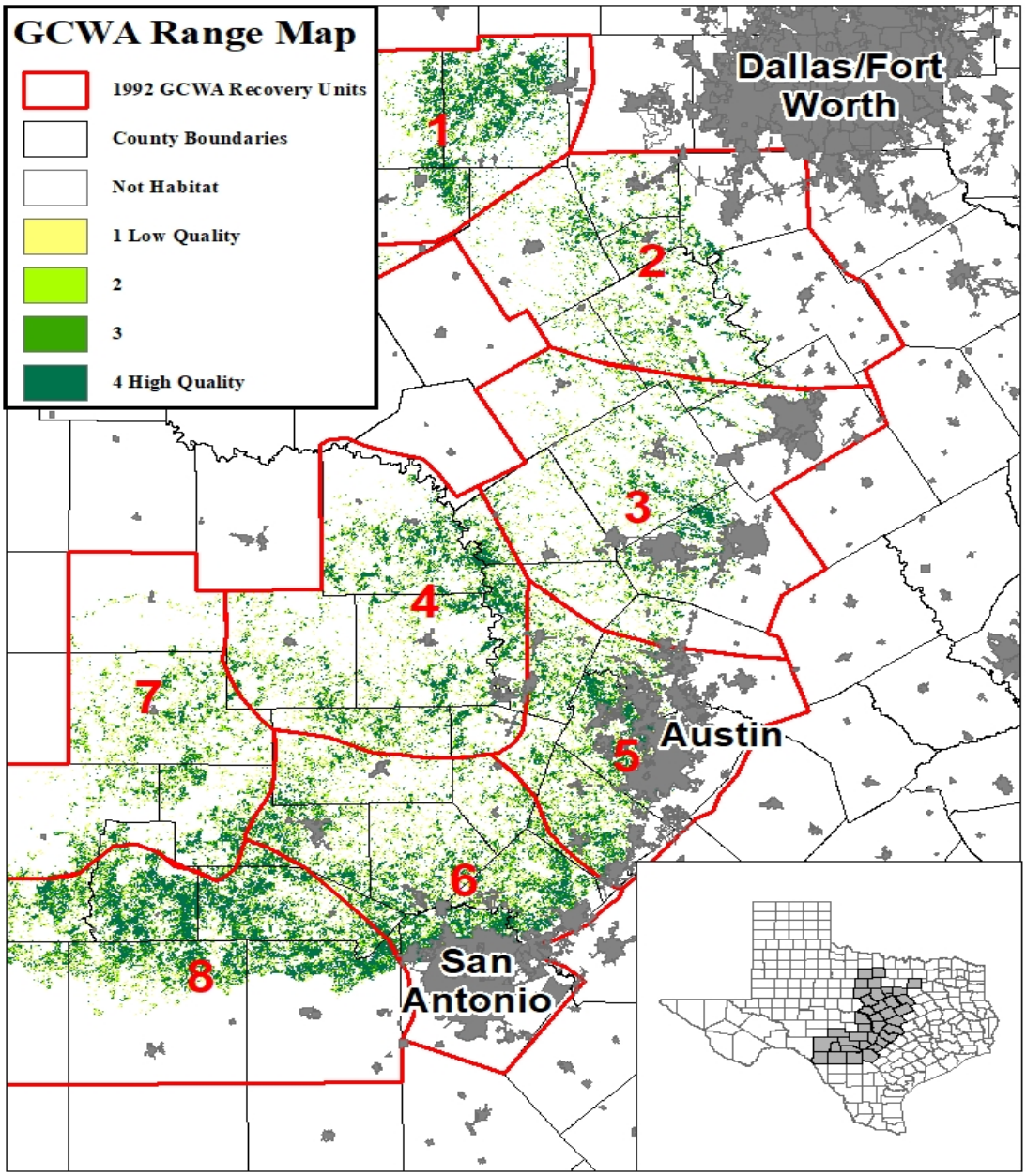
A. Species Description and Life History

The GCWA was emergency listed as endangered on May 4, 1990 (55 FR 18844). The final rule listing the species was published on December 27, 1990 (55 FR 53160). No critical habitat is designated for this species.

The GCWA is a small, insectivorous songbird, 4.5 to 5 inches long with a wingspan of approximately 8 inches (Pulich 1965 and 1976, Oberholser 1974). Golden-cheeked warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands of the central Texas Hill Country west and north of the Balcones Fault, which runs approximately along the Interstate 35 corridor (Figure 1)(Pulich 1976). Golden-cheeked warblers require the shredding bark produced by mature Ashe junipers for nest material. Typical deciduous woody species include Texas oak (*Quercus buckleyi*), Lacey oak (*Q. glaucoides*), live oak (*Q. fusiformis*), Texas ash (*Frazinus texensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), and pecan (*Carya illinoinensis*) (Pulich 1976, Ladd 1985, Wahl *et al*. 1990). Breeding and nesting GCWAs feed primarily on insects, spiders, and other arthropods found in Ashe junipers and associated deciduous tree species (Pulich 1976).

Male GCWAs arrive in central Texas around March 1st and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. Females arrive a few days later, but are more difficult to detect in the dense woodland habitat (Pulich 1976). Three to five eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June (Pulich 1976). If there is

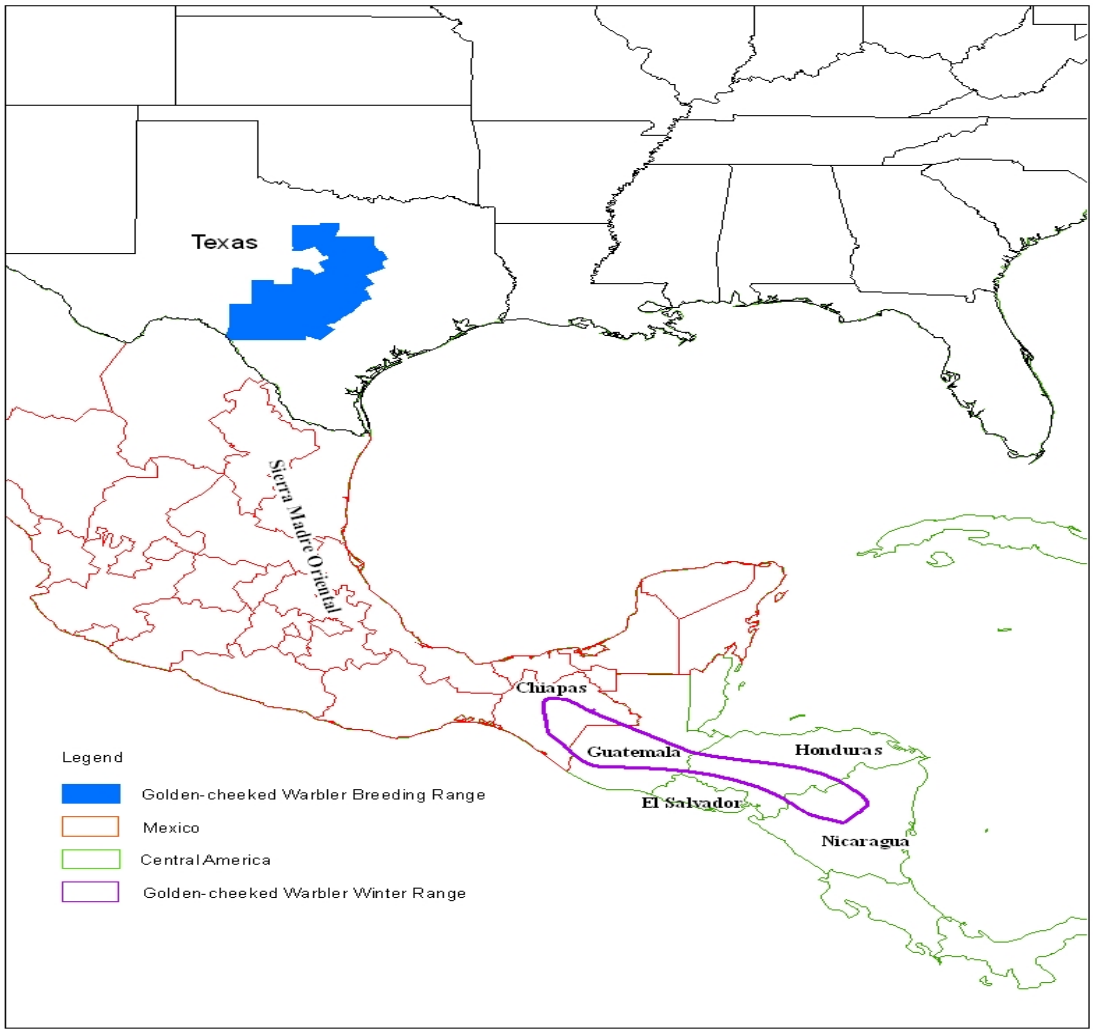
Figure 1: GCWA Breeding Range in Texas, Diamond (2007) Model C.



a second nesting attempt, it is typically in mid-May with nestlings fledging in late June to early July (Pulich 1976). By late July, GCWAs begin their migration south where they winter in the highland pine-oak woodlands of southern Mexico and northern Central America (Figure 2)(Kroll 1980, Chapman 1907, Simmons 1924).

In their breeding range, GCWA pairs have been found in habitat patches smaller than 25 acres; however, successful reproduction is more likely if patches of habitat exceed 37 acres (Arnold *et*

Figure 2: GCWA Wintering and Breeding Range



al. 1996, Butcher 2010). One study indicated that the probability of occupancy of a particular patch by GCWAs increases with increasing patch size, reaching a probability of 100 percent between approximately 400 and 500 acres (Collier *et al.* 2008). Reproductive success of GCWAs is higher in large, un-fragmented patches of habitat as compared to small, fragmented patches, and reproductive success increases as forest edge decreases (Maas-Burleigh 1998, Coldren 1998, Peak 2007, Reidy *et al.* 2009).

Research on the wintering range found that GCWAs prefer foraging in deciduous trees in pine-oak forests (Thompson 1995, Rappole 1996). In their wintering habitat, GCWAs usually occur in mixed-species flocks that move within a home range that varies from 4.4 to 23.7 acres (Braun *et al.* 1986, Vidal *et al.* 1994, Rappole *et al.* 1999, King and Rappole 2000). While as many as twelve GCWAs have been seen in one flock, studies show that most flocks only contain one GCWA (Kroll 1980; Braun *et al.* 1986, Vidal *et al.* 1994, Thompson 1995, Rappole *et al.* 1999).

B. Historic and Current Distribution

Golden-cheeked warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands of the Edwards Plateau, Lampasas Cut-Plain, and Llano Uplift regions of central Texas from March to August (Kroll 1974, Oberholser 1974, Pulich 1976). In July GCWAs begin migrating southward from Texas through the Sierra Madre Oriental mountain range and winter in the mountainous regions (highlands) of southern Mexico (Chiapas) and Central America (Guatemala, Honduras, El Salvador, and Nicaragua)(Ridgeway 1902, Oberholser 1974, Pulich 1976, Perrigo and Booher 1994, Rappole *et al.* 1999, Komar 2008).

When migrating north and south along the Sierra Madre Oriental of Mexico, GCWAs go through the Mexican states of Coahuila, Nuevo Leon, Tamaulipas, Queretaro, and Veracruz (Phillips 1911, Pulich 1976, Johnson *et al.* 1988, Lyons 1990, Perrigo *et al.* 1990). Sightings are typically at elevations above 3,609 feet in the pine (*Pinus* spp.), pine-oak (*Quercus* spp.), and oak-sweetgum (*Liquidambar styraciflua*) woodlands of the Sierra Madre Oriental (Braun *et al.* 1986, Johnson *et al.* 1988, Perrigo *et al.* 1990, Perrigo and Booher 1994).

In Central America, the occurrence of GCWAs in northern El Salvador and north-central Nicaragua during the winter was only confirmed in 2008 and 2009 (Morales *et al.* 2008, King *et al.* 2009, Komar 2008). In addition, several new areas with warbler occurrences have been documented since 2000 (Jones and Komar 2008a and 2008b). Eight sightings from Costa Rica (highlands of the Central Valley) and one from Panama suggest the warbler's wintering range may extend further south than Nicaragua (Jones 2005, Jones and Komar 2006).

The Alliance for the Conservation of Mesoamerican Pine-oak Forest (2008, ACMPOF) developed a map of potential wintering habitat based on documented sightings (Pulich 1976, Vidal *et al*. 1994, Thompson 1995, Rappole *et al.* 1999, ACMPOF 2008). The area covered by pine-oak forests and pure oak stands (*Quercus* spp.), considered potential GCWA habitat, ranges from 2,953 to 7,218 feet above sea level. This area is approximately 7500 square miles, or 18.78 percent of the ecoregion's total area (ACMPOF 2008). A survey in Honduras indicated that GCWAs have less specific habitat requirements in their wintering range as long as the habitat is forested and contains approximately 60 square feet per acre of encino oak (King *et al.* 2012).

C. Reasons for Decline and Threats to Survival

Ongoing and imminent habitat loss continues to threaten the GCWA. Historically, the primary cause of habitat loss was juniper clearing to create pastures for cattle grazing (Pulich 1976). Other causes of habitat loss included cutting junipers for fence posts, furniture, and cedar oil. However, recent habitat loss in Travis, Williamson, and Bexar Counties is due to rapid suburban development (Biological Advisory Team 1990, Groce *et al.* 2010). Furthermore, human population growth is projected to increase throughout the GCWA's range (Groce *et al.* 2010). As the human population continues to increase, so do associated roads, single and multi-family residences, and infrastructure, resulting in continued habitat destruction, fragmentation, and increased edge effects (Groce *et al*. 2010, Duarte *et al.* 2013).

Habitat models within the last decade estimate between 3.9 million (Duarte *et al*. 2013) to 4.1 million (Morrison *et al.* 2010) acres of potential GCWA habitat range-wide. Between 1999-2001 and 2010-2011 Duarte *et al.* (2013) found range-wide habitat loss to be 29 percent overall. Additionally, Groce *et al.* (2010) expects loss of available GCWA habitat within the breeding range will continue to occur.

Fragmentation is the reduction of large blocks of habitat into several smaller patches. While GCWAs have been found to be reproductively successful in small patches of habitat (<50 acres), there is an increased likelihood of occupancy and greater abundance as patch size increases (Coldren 1998, Butcher *et al*. 2010, DeBoer and Diamond 2006). Correlations also exist with increases in pairing and territory success with increasing patch size (Arnold *et al*. 1996, Coldren 1998, Butcher *et al*. 2010). In addition, while some studies have suggested that GCWAs occupy small patches that occur close to larger patches, the long-term survival and recovery of the GCWA is dependent on maintaining the larger patches (Coldren 1998, Peterson 2001, TNC 2002, Reidy *et al.* 2016).

As GCWA habitat fragmentation increases the amount of GCWA habitat edge, where two or more different vegetation types meet, also increases. For the GCWA edge is where woodland becomes shrubland, grassland, a subdivision, etc., and depending on the type of edge, it can act as a barrier for dispersal, act as a territory boundary, favor certain predators, increase nest predation, and reduce reproductive output (Lovejoy *et al.* 1986, Wilcove *et al.* 1986, Johnston 2006, Arnold *et al*. 1996). Canopy breaks (the distance from the top of one tree to another) as little as 36 feet can be barriers to GCWA movement (Coldren 1998). Territory boundaries not only will stop at edges, but GCWAs are more often farther from habitat edges (Beardmore 1994, DeBoer and Diamond 2006, Sperry 2007).

Additional threats to the GCWA breeding habitat include reduced oak recruitment due to herbivory from native and non-native animals, death of mature oaks from oak wilt, and the potential for catastrophic wildland fires from increasing fine fuel loads and urban encroachment (Groce *et al.* 2010).

The ongoing destruction and fragmentation of pine-oak forests throughout the GCWA's migration and wintering habitat has been due to unsustainable forestry practices, fires from agricultural conversion, extraction of timber, and cattle ranching (Dinerstein *et al.* 1995, Redo *et al*. 2009, Groce *et al.* 2010). While some countries have a legal framework that encourages sustainable forestry, they still allow clearcutting, which results in forest fragmentation, reduced species diversity, and soil loss (ACMPOF 2008).

D. Range-wide Survival and Recovery Needs

The recovery strategy outlined in the Golden-cheeked Warbler Recovery Plan (Service 1992) divides the breeding range into eight regions, or units, delineated based primarily on watershed, vegetation, and geologic boundaries, and calls for the protection of sufficient habitat to support at least one self-sustaining population in each unit. According to the Golden-cheeked Warbler Population and Habitat Viability Assessment Report (Service 1996; GCWA PHVA) a viable population needs to consist of at least 3,000 breeding pairs. This and other population viability

assessments on GCWAs have indicated the most sensitive factors affecting their continued existence are population size per patch, fecundity (productivity or number of young per adult), and fledgling survival (Service 1996, Alldredge *et al.* 2002). These assessments estimated one viable population will need a minimum of 32,500 acres of prime un-fragmented habitat to reduce the possibility of extinction of that population to less than 5 percent over 100 years (Service 1996). Further, according to the GCWA PHVA, this minimum carrying capacity threshold estimate increases with poorer quality habitat (e.g., patchy habitat resulting from fragmentation).

Based on the GCWA Recovery Plan (Service 1992), protection and management of occupied habitat and minimization of degradation, development, or environmental modification of unoccupied habitat necessary for buffering nesting habitat are necessary to provide for the survival of the species. Habitat patches should be larger and composed of a mixture of juniper and mixed forest (Reidy *et al.* 2016). Efforts, such as land acquisition and conservation easements, to protect existing viable populations is critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat.

While the overriding majority of the species' breeding range occurs on private lands that have been either occasionally or never surveyed, several State and federally owned lands occur within the breeding range of the GCWA that provide long-term protection. Based on Groce *et al.* (2010) they include 77,198 acres of Department of Defense lands (Fort Hood, Camp Bullis, and U.S. Army Corps Engineers); 39,428 acres on Texas Parks and Wildlife Department lands; 2,844 acres on Lower Colorado River Authority properties; 14,789 acres on the Balcones Canyonlands National Wildlife Refuge. Over 50,000 acres of additional lands owned across the range by cities, counties, conservation organizations, and others, including several Service approved conservation banks (CB) whose goal is to protect GCWA habitat (acreages represent the total if the entire bank of credits are sold): Hickory Pass CB (3,003 acres) in Burnet County, Bandera Corridor CB (6,946 acres) in Bandera and Real counties, Camp Wood (4,012 acres), and Festina Lente CB (1,132 acres) in Bandera County.

Mexico has become an active participant in international wildlife programs, like the Convention on International Trade in Endangered Species, Convention on Biodiversity, and the North American Agreement on Environmental Cooperation (Valdez *et al.* 2006). Most important action was the signing of an agreement between wildlife conservation agencies of the United States, Mexico, and Canada establishing a Trilateral Committee for wildlife and ecosystem conservation and management, which implements a multitude of conservation projects ranging from biological inventories to capacity building (Valdez *et al.* 2006). Continued partnerships such as these are crucial to successfully recovering the GCWA.

Since listing, there have been several efforts to encourage the preservation of GCWAs within the wintering range. The most notable effort is the 2003 formation of the Alliance for the Conservation of Mesoamerican Pine-oak Forests[1] (ACMPOF 2008), which consists of eight institutions located in the United States, Mexico, Guatemala, El Salvador, Honduras, and Nicaragua. The ACMPOF (2008) drafted a conservation plan for the ecoregion with the goal of

[1] The 'Alliance' adopted the term Mesoamerica to accurately describe the geographic region within which conservation actions occur.

conserving the pine-oak forest ecosystem and in turn ensuring the survival of the GCWA. This conservation plan represents the first regional management, conservation, and sustainable development effort for pine-oak forests with the purpose of promoting and sustaining biodiversity, water, timber, recreation, and sustainable rural development (ACMPOF 2008).

Despite these conservation efforts, many institutions lack legal mechanisms for protecting the area, and those that do have legal mechanisms are either not well-enforced or allow natural resource extraction. Considering these challenges, we believe that non-profits such as Pronatura Sur, Defensores de la Naturaleza, Salvanatura, and TNC are most effective at furthering conservation efforts in the wintering range.

IV. Environmental Baseline

The Davis Ranch Tract is in Recovery Region 6 (Service 1992). No recent county-wide or recovery region-wide surveys have been conducted. Golden-cheeked warbler surveys from varying portions of the Davis Ranch occurred in 2007, 2013, and 2015 (Figure 3 of the HCP):

- 350 acres in 2007 by SWCA biologists resulting in 1 GCWA detection over 7 survey days
- 244 acres in 2013 and 2015 by Pape-Dawson biologists resulting in 3 to 4 GCWA detections on 1 survey day in 2013 and GCWAs detected on 5 of the 6 survey days in 2015
- Texas Parks and Wildlife Department (TPWD) documented occupancy on the adjacent Government Canyon State Natural Area (GCSNA) in 2017

SWCA produced a habitat delineation of the entire Davis Ranch. As part of this effort, SWCA considered aerial imagery and modeled vegetation communities, available environmental reports including presence/absence survey data, and conducted a site inspection. The delineation resulted in 567.12 acres of potential GCWA habitat and an additional 84.98 acres of potential GCWA habitat within 300 feet (SWCA 2016a, 2016b; Figure 4 of the HCP). The remaining acreage is non-habitat and is primarily composed of mesquite trees, a mixture of mesquite and Ashe juniper trees, or fallow pastureland and occurs primarily around the existing residence, along some woodland margins, and along roadways.

There has never been a comprehensive survey of GCWAs in Recovery Region 6. However, Groce *et al.* (2010) summarized surveys completed between 2005 and 2009 that documented more than 900 GCWAs in this region. GCWA habitat estimates for Recovery Region 6 ranged from 389,436 (Morrison *et al.* 2010) to 575,944 (Duarte *et al*. 2013) acres. This was a 36 percent decrease between 1999-2001 and 2010-2011, and units 5, 6, and 8 had the most pronounced reduction in mean habitat patch size (Duarte *et al*. 2013). Estimates for the amount of GCWA habitat in Bexar County around 2010 ranged from 59,000 to over 84,000 acres (Diamond *et al.* 2010, Hayes 2010). Of the total acreage available to GCWAs in Bexar County over 23,800 acres are currently in some form of park or preserve managed for the GCWA.

According to our consultations tracking database, there have been 73 formal section 7 consultations on the GCWA (not including those processed as part of a 10(a)(1)(B) permit which

are discussed below). The action area these consultations covered was over 65.4 million acres. Multiple consultations were done on Fort Hood, Camp Bullis, and Camp Stanley; however, we have only counted the action areas once for the total area covered by these formal consultations. The action areas for one brush control consultation covered almost half of Texas at 60 million acres, with another at 773,000 acres, and a prescribed fire consultation covered another 4.2 million acres. However, only 52,000 acres of GCWA habitat were actually authorized to be impacted by these 3 consultations with the majority of that acreage being indirectly effected (i.e. the habitat remained intact). Of the remaining acreage of authorized take (almost 87,000 acres in total), almost 41,000 acres of impacts were authorized on DOD lands, also mostly indirectly effected. The result of all of these consultations is over 80,000 acres of GCWA habitat maintained on DOD or private land preserved or maintained for the benefit of the GCWA.

Additionally, we have issued 137 individual 10(a)(1)(B) incidental take permits on the covering the GCWA on more than 74 million acres (this is the permit area, not the actual acres of impacted habitat). In total we have authorized impacts to almost 58,000 acres of GCWA habitat range-wide. Of this total 37,400 acres were part of large scale HCPs (total take authorization indicated in parentheses): Williamson County's RHCP (6,000 acres), Oncor's programmatic HCP (3,000 acres), Hays County's RHCP (9,000 acres), LCRA's CREZ HCP (1,100 acres), Comal County's RHCP (9,000 acres), and the Southern Edwards Plateau HCP (9,300 acres). The result of all HCPs if fully implemented is over 62,000 acres of land preserved for the benefit of the GCWAs.

According to our consultations database, there have been four 10(a)(1)(B) incidental take permits issued in the action area for the GCWA. These HCPs authorized impacts to over 10,400 acres and, at full implementation, would result in over 24,300 acres of GCWA habitat preservation. Excluding the multi-county consultations that include Bexar County (where take was not quantified by county) and the four 10(a)(1)(B) consultations, there have been 12 formal section 7 consultations on GCWAs in the action area, 4 of which were with Camp Bullis or Camp Stanley. These consultations authorized impacts to over 3,200 acres of GCWA habitat and resulted in the protection of at least 7,300 acres of GCWA habitat.

V. Effects of the Action

The Service is authorizing direct impacts to 567.12 acres and indirect impacts to 84.98 acres for a total of 652.1 acres of impacted GCWA habitat from Covered Activities (see Figure 4 of the HCP). The effects of the action include both the direct and indirect effects of implementing the Davis Ranch HCP. Direct impacts from implementation of the HCP include habitat removal, degradation, and fragmentation. Indirect impacts from implementation of the HCP could occur from increased edge, which can increase the presence of nest predators and parasites, and reduction in patch quality and overall habitat suitability.

If GCWA habitat range-wide is 2.2 million (Duarte *et al*. 2013) to 2.78 million (Morrison *et al.* 2010) acres, the amount of effected habitat proposed by the Davis Ranch HCP is 0.02 to 0.03 percent of all GCWA habitat range-wide. Based on potential habitat estimates of 59,000 (Diamond *et al.* 2010) to over 84,000 (Hayes 2010) acres, the Davis Ranch HCP is 0.8 to 1.1 percent within the action area. To minimize and mitigate for the impacts on the GCWA, the

Applicant will: (1) avoid directly taking GCWAs by conducting initial clearing activities during periods when the species is not present in the area; (2) minimize potential indirect habitat effects by taking steps to prevent the spread of oak wilt; and (3) mitigate for destruction or modification of GCWA habitat by purchasing up to 1,176.73 GCWA conservation credits composed of high quality GCWA habitat from a Service-approved conservation bank with a service area that includes Bexar County, or participating in the Southern Edwards Plateau HCP. The mitigation ratio is 2 acres of mitigation for every acre of direct impact and half an acre of mitigation for every acre of indirect impact.

Critical habitat has not been designated for the GCWA; therefore, no impacts to critical habitat will occur.

VI. Cumulative Effects

Bexar County has undergone rapid and sustained development and continues to be a fast growing urban area, including the land in the vicinity of the project. We assume, with or without the proposed action, urban development will continue to encroach upon the important areas for listed species in the action area.

An undetermined number of future land use conversions and routine agricultural practices are not subject to Federal authorization or funding and may alter the habitat or increase incidental take of GCWAs and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) loss of GCWA habitat due to urbanization; (2) increase in impervious cover due to urbanization (i.e., roads); (3) nest parasitism; and, (4) predation by feral animals and pets. Specific project types within the action area that could have an effect on the GCWA include, but are not limited to: urban development, including associated infrastructure; roads, including more roads and widening of existing roads; and conversion of woodland to impervious cover.

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

VII. Conclusion

After reviewing the current status of the GCWA, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of this species. No critical habitat has been designated for the GCWA; therefore, none will be affected. Implementation of the Davis Ranch HCP will provide a recovery benefit to the GCWA through permanently preserved GCWA habitat that is a large, contiguous patch of GCWA habitat. Preservation of larger blocks will have greater success in long-term conservation of GCWAs.

Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined by the Service as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is further defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding and sheltering (50 CFR §17.3). Harm is also further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns, including breeding, feeding, and sheltering. Incidental take is defined by the Service as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary and must be implemented by the Service so that they become binding conditions of any authorization issued to implement a project covered by this biological opinion, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the authorizations, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Service must report the progress of the action and its effect on the species. [50 CFR 402.14(i)(3)].

A. Amount or Extent of Take

The Service anticipates incidental take of GCWAs will occur as a result of the proposed action. Individuals of these species are difficult to detect unless they are observed undisturbed in their environment. Most close-range observations of this species represent chance encounters that are difficult to predict. Because quantifying take of individuals is difficult, this biological opinion instead evaluates acres of habitat removed as a surrogate for the level of incidental take. The incidental take from the proposed action is expected to occur in the form of harm through direct loss of habitat and indirect adverse effects resulting from the issuance of an incidental take permit pursuant to 10(a)(1)(B) of the Act. The following amount of incidental take will be authorized by the proposed Permit:

1. No more than 652.1 acres of GCWA habitat that occur within Bexar County may be adversely affected;

Because of the inconsistencies with previous surveys, we do not have a good understanding of how many GCWAs use the Davis Ranch. However, Groce *et al.* (2010) estimated GCWA densities in Bexar County; derived from surveys conducted in Bexar, Kendall, and Comal counties; and estimates GCWA density ranges from 5,548 to 11,095 within available potential

habitat in the area. If average density of singing males ranges from 2.0 (Pulich 1976) to 4.1 (Cooksey and Edwards 2008) per 100 acres, the number of GCWA territories that may be lost as a result of the Covered Activities could range from 13 to 26.

B. Effect of the Take

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy of the GCWA due to long-term beneficial effects associated with the proposed mitigation. No critical habitat has been designated for the GCWA; therefore, none will be affected.

C. Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of GCWAs in the action area. The Service shall:

1. require that the Applicant fully implements the Davis Ranch HCP and comply with all terms and conditions of the issued section 10(a)(1)(B) incidental take permit; and
2. suspend or revoke the Applicant's Permit if new information becomes available that demonstrates direct or indirect take of non-covered species. The Service will notify the Davis McCrary Property Trust that their Permit is suspended as soon as we become aware of such take.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following term and condition that implements all of the reasonable and prudent measures described above and outlined reporting/monitoring requirements. This term and condition is non-discretionary.

1. Ensure that the Davis McCrary Property Trust fully complies with avoiding and minimizing incidental take, in the form of harm, of GCWAs through full implementation of the *Davis Ranch Habitat Conservation Plan*;
2. ensure that Davis McCrary Property Trust fully mitigates the effects of the incidental take of GCWAs, as described in the *Davis Ranch Habitat Conservation Plan*; and
3. the authorization granted by the Permit is subject to compliance with all terms and conditions contained in the Permit.

The reasonable and prudent measures, with their implementing term and condition, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring re-initiation of consultation and review of the reasonable and prudent measures.

VIII. Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered or threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or designated critical habitat, to help implement recovery plans, or to develop information.

- The Service through the Applicant should work to encourage residents to use xeriscape and native vegetation landscaping within residential lots and along access roads.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

IX. Reporting Requirements

The reasonable and prudent measures, with their implementing terms and conditions, are designed to avoid, minimize, and mitigate effects of incidental take that might otherwise result from the proposed action. If, during the course of the authorized activities, this level of incidental take is exceeded prior to the annual review, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Service must immediately provide an explanation of the causes of the taking and review the need for possible modification of the reasonable and prudent measures. This biological opinion will expire at the expiration of the incidental take permit issued to implement the Davis Ranch HCP. Issuance of a new biological opinion will be subject to evaluation of the recovery of the species.

X. Reinitiation Notice

This concludes formal consultation on the issuance of a Service 10(a)(1)(B) permit for the Davis Ranch Habitat Conservation Plan to minimize and mitigate, to the maximum extent practicable, adverse effects to the GCWA for covered activities described in the Davis Ranch HCP over a period of 30 years. As provided in 50 CFR Sec. 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of authorized incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in this biological opinion; or, (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Approved:

Adam Zerrenner, Field Supervisor
Austin Ecological Services Field Office

May 22, 2019
Date

Concur:

Deputy Regional Director
Region 2

25 June 2019
Date

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